UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/004,567	12/04/2001	Michael Dollard	CISCO-4758	7087

21921 7590 02/07/2006

DOV ROSENFELD
5507 COLLEGE AVE
SUITE 2
OAKLAND, CA 94618

EXAMINER	
TSE, YOUNG TOI	

ART UNIT	PAPER NUMBER
2637	

DATE MAILED: 02/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/004,567	DOLLARD, MICHAEL	
	Examiner	Art Unit	
	YOUNG T. TSE	2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 December 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,14-21,24 and 25* is/are rejected.

7)☒ Claim(s) *11-13,22 and 23* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *05302002*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on May 30, 2002 has been partially considered by the examiner. The U.S. Patent Application Nos. 09/253,152 and 09/513,719 have not been considered because they are now U. S. Patent Nos. 6,657,950 and 6,687,307, respectively. However, the two U.S. Patents have been cited in the PTO-892 by the examiner.

Specification

2. The disclosure is objected to because of the following informalities: the specification fails to explain the operation of Figure 3C in the Detailed Description of the Specification. Appropriate correction is required.

Claim Objections

3. Claims 1-8, 11-13, 17-19 and 22-25 are objected to because of the following informalities:

In line 1 of claims 1, 5, 18 and 19, "Apparatus" should be changed to "An apparatus".

The dependent claims 2 and 3 are depended upon claim 1.

In claim 4, line 3, "output" should be "an output".

The dependent claims 6 and 7 are depended upon claim 5.

In claim 8, lines 1-2, "claim 5 wherein said analog to digital converter over samples" should be "claim 7 wherein said analog to digital converter oversamples".

In claim 11, line 1, "a N-point" should be "an N-point" and line 5, "inverse Fourier transform" should be "inverse fast Fourier transform".

In claim 12, line 8, "N point" should be "N-point".

In claim 13, line 4, "N/2" should be "N/2-point".

In claim 17, line 1, "claim 15" should be "claim 16".

In claim 18, line 3, "an OFDM frequency domain symbol" should be "a frequency domain OFDM symbol".

In claim 22, line 2, "computer product" should be "computer program product"; line 6, "inverse Fourier transform" should be "inverse fast Fourier transform"; line 7, "N/2" should be "N/2-point"; and line 9, "real-valued" should be "complex-valued".

In claim 23, line 9, "N point" should be "N-point".

In claim 24, line 7, "code" should be "codes".

The dependent claim 25 is depended upon claim 24.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-10, 14-21 and 24-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1, 5, 9, 14, 18-20 and 24, "IF" is undefined.

In claim 1 (line 5), claim 2 (line 2), claim 3 (line 2) and claim 15 (line 4), the phrases "said group of subchannels", "said samples", "said time domain burst" and "said frequency domain OFDM symbol" all lack antecedent basis.

In claim 2, line 2, the phase "said subcarriers" also lacks antecedent basis because it is unclear "the group of subcarriers" or "the modulated subcarriers" recited in claim 1.

The dependent claims 4, 6-8, 10, 16-17, 21 and 25 are depended upon claims 1, 5, 9, 14, 20 and 24.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-4, 9-10, 18 and 20-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Jeong et al. (US 2002/0080887 A1).

Jeong discloses an OFDM transmitter in Figure 1 comprising an IFFT transformer 100 for transforming OFDM symbols; a guard interval inserting unit 110 for inserting a guard interval between the OFDM symbols in order to eliminate an inter-symbol interference, thereby generating an OFDM frame; and an RF processing unit (120, 130, 140) for performing a conversion of the OFDM frame into an analog radio frequency signal so that the OFDM signal can be transmitted in a specific frequency channel of an FM frequency band, and for amplifying and outputting the analog radio frequency signal.

With respect to claims 1, 9, 18 and 20, the IFFT transformer 100 converts a group of subcarriers of the OFDM symbols from frequency domain symbols into time domain symbols, wherein the number of subcarriers constructing the OFDM symbol is 512, and the OFDM symbol is modulated by using the 2048 IFFT 100 as shown in Fig. 26, to thereby generate an intermediate frequency (IF) signal whose central frequency is about 1446 KHz. See paragraph [0103] and paragraph [0108], lines 15-20.

With respect to claims 2-4, 10 and 21, the claimed subject matters are well known to a person skill in the art in a typical OFDM transmitter. For example, the real values are adjusted by the IFFT transformer 100 because the OFDM symbols are complex values; the guard interval inserting unit 110 adds a cyclic prefix to the time domain of the IFFT transformer; and the D/A converter 120 converts digital signals to analog signals from the IFFT transformer.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 5-8, 14-17, 19 and 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matheus et al. (US 2002/0021715 A1) in view of Harada et al. (US 5,774,450).

Matheus discloses a frequency tracking device (FTD) used in different embodiments of Figures 4-1, 5, 7 and 8 located within an OFDM receiver of Figure 1-2.

With respect to claims 5, 14, 19 and 24, the FTD device, for example, shown in Figure 4-1 comprises an FFT transformer 8 for converting time domain samples to a frequency domain OFDM symbol and a selector for selecting N subcarriers of the frequency domain symbol to an evaluation circuit. See abstract and paragraphs [0028], [0052], [0094] and [0095]. However, Matheus does not explicitly show or suggest that the selected subcarriers of the frequency domain OFDM symbol are centered at an intermediate frequency (IF) as baseband frequency domain symbols thereby frequency shifting the selected subcarriers to baseband.

Harada also discloses an OFDM receiver and teaches that at a transmitter end, an OFDM signal is converted into an OFDM signal in the occupied frequency band of a transmission line from an OFDM signal in an intermediate frequency band. On the other hand, at a receiving end, the received OFDM signal is converted into an OFDM

signal in an intermediate frequency band (its center frequency) for a demodulating operation from an OFDM signal in the occupied frequency band of the transmission line in demodulating data (column 1, line 66 to column 7). Harada also suggest the quadrature detector 300 shown in Figure 12 converts the OFDM signal in the intermediate frequency band into an OFDM signal in a base band, wherein the output of the quadrature detector 300 is connected to the Fourier transformer 400 and the demodulation circuit 500 (column 2, lines 64-67).

Since Harada teaches that the OFDM signal of a frequency domain OFDM symbol is centered at an intermediate frequency in a baseband, inherently, the selected subcarriers of the frequency domain OFDM symbol shown in Figure 4-1 of Matheus' FTD device are capable of frequency shifting the selected subcarriers to baseband. Therefore, it would have been obvious to one of ordinary skill in the art to use Matheus' selector for selecting subcarriers of the frequency domain OFDM symbol from the FFT transformer centered at an intermediate frequency as taught by Harada in order shift the frequency of the selected subcarriers to baseband.

With respect to claims 6-8, 15-17 and 25, the claimed subject matters are well known to a person skill in the art in a typical OFDM receiver. For example, by reducing a transform length before processing the real values by the FFT transformer since OFDM symbols are complex values and an A/D converter converts a transmitted signal into digital signal to the FFT transformer.

Allowable Subject Matter

Claims 11-13 and 22-23 would be allowable if rewritten or amended to overcome the objection(s) set forth in this Office action.

10. The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to show or suggest a method or a computer program product for using an N/2-point to transform N-point complex-valued series to an N-point real-valued series by mapping the N-point complex-valued series to a first N/2-point complex-valued series using a first mapping function, performing an inverse fast Fourier transform on the first N/2-point complex-valued series to obtain a second N/2 complex-valued series, and mapping real and imaginary components of the second N/2-point complex-valued series to the N-point real-valued series using a second mapping function.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sayeed is related to an OFDM transmitter comprising an IFFT transformer for transforming OFDM samples into 2048 samples and an GI insertion module for converting the 2048 samples into 2216 samples for transmission.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YOUNG T. TSE whose telephone number is (571) 272-

3051. The examiner can normally be reached on Monday-Thursday and alternative Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272-2988. The Central FAX Number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

YOUNG T. TSE
Primary Examiner
Art Unit 2637